

## REMARKS

This Amendment is responsive to the Office Action that was mailed November 4, 2005 (hereinafter "Office Action").

### Amendments to the Specification

The specification has been amended on page 16 beginning at line 27 to correct a spelling error and to correct the reference number associated with the described reactor. These were inadvertent errors and their correction through this amendment does not introduce new matter into the application.

### Claim Rejections Under 35 U.S.C. § 112

Claims 1-27 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 stands rejected for its recitation of "a products vessel configured to receive a portion of the liquid components and gases from the overflow outlet" when the claim fails to disclose gases as a component of the slurry. Similarly, claim 13 stands rejected for its recitation of "directing separated liquid components and gases through the overflow outlet and into a products vessel", when the claim fails to disclose gases as a component of the slurry.

The gases recited in claims 1 and 13 are not necessarily components of the slurry. As described on page 13 bridging to page 14, a degassing unit may optionally be disposed upstream of the slurry inlet of the hydrocyclone for removing gases from the slurry before it is introduced into the hydrocyclone. Rather, the recited gases are gases that are drawn into the hydrocyclone through the underflow outlet as a result of the siphon effect that occurs during the operation of the hydrocyclone. Attention is directed to the specification beginning on page 7, line 36 and bridging to page 8, which describes how the rotational motion of the slurry within the hydrocyclone creates a siphon effect at the underflow outlet that draws gases into the hydrocyclone. Along with liquid components separated from the slurry, at least a portion of these gases flow out through the overflow outlet and into a products vessel. See specification, page 9, lines 1-9.

In light of the description relating to gases that are drawn into the hydrocyclone during its operation, claims 1 and 13 are not believed to be vague or indefinite. Reconsideration and withdrawal of the rejection of claims 1-27 under 35 U.S.C. §112, second paragraph, is respectfully requested.

**Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 1, 4-8, 11-15, 20-23 and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Stowell, U.S. Patent No. 3,439,650 ("Stowell").

Stowell is directed to a system for refining ink particles so that ink particles within a given size range are made available for use in an inking station for developing a dielectric web that is placed in contact with the particles. There are two refining means in the disclosed system. A cyclonic separator 18 is first used to remove particle fines that are too small for use in the inking station and then screening vessel 25 is used to remove excessively large ink particles.

Regarding claim 1 and the claims depending therefrom, there is no disclosure in Stowell that the system or any of its components would be suitable for use in separating liquid from solid components in a slurry. More specifically, although Stowell teaches filter box 60 for removing fines from a stream received from upper outlet 20, as taught, filter box 60 is not configured or capable of receiving liquids. Moreover, Stowell fails to teach any means for providing fluid communication between a products vessel and lower outlet 22 of separator 18. While Stowell discloses and illustrates conduits for providing an air stream that carries ink particles from reservoir 19 to tangential inlet 17 of separator 18, no means are disclosed for providing fluid communication between a products vessel that is connected to an overflow outlet of the separator, and lower outlet 22 of that separator.

Regarding claim 13 and the claims depending therefrom, Stowell fails to teach the step of directing separated liquid components and gases into a products vessel. In addition, Stowell also fails to teach the step of providing fluid communication between a products vessel and lower outlet 22. The system disclosed in Stowell is for separating dry ink particles in two stages, first based upon their mass and then upon size. There is no teaching or disclosure in

Stowell that either of these refining means would function as intended if liquids were present.

Because Stowell fails to teach one or more of the recited elements of each of claims 1 and 13, reconsideration and withdrawal of the rejection of claims 1, 4-8, 11-15, 20-23 and 25 under 35 U.S.C. §102(b) as being anticipated by Stowell is respectfully requested.

Claims 1-8, 10-14, and 16-25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Robinson, U.S. Patent No. 5,186,823 ("Robinson").

Robinson relates to an apparatus for removing coarse particles from a fiber suspension liquid, such as might be produced in paper manufacturing. The device includes a hydrocyclone 15 that is disposed within cylinder 20. Cylinder 20 has overflow outlet 25 in its upper part and liquids that have flowed out of cyclone 15 into cylinder 20 can ascend up through cylinder 20 and out through outlet 25 into secondary chamber 14 where additional settling can occur. Col. 3, lines 11-26. Solid coarse materials, referred to as "reject", flow out of hydrocyclone 15 through cylindrical reject nozzle 22 and settle to the bottom of cylinders 20 and 30. Col. 4, lines 21-23. Clarified liquid and fine fiber particles that are separated from the coarse materials within hydrocyclone 15 flow out through "accept" outlet 18. Col. 5, lines 7-11. The coarse separator of Robinson is an open system that is open to atmospheric pressure. Col. 3, lines 27-32. In addition, Robinson describes in detail how certain dimensional conditions for the coarse separator must be fulfilled. See col. 5, lines 12-39 and Figs. 1-3.

Regarding claims 1 and the claims depending therefrom, Robinson fails to teach or disclose a products vessel configured to receive a portion of the liquid components and gases from the overflow outlet. Although hydrocyclone 15 directs a clarified liquid out of accept outlet 18, there is no teaching in the reference as to any vessel or container connected to outlet 18. Moreover, Robinson also fails to teach any means for providing fluid communication between such a products vessel and cylindrical reject nozzle 22. There is no teaching or suggestion in Robinson that a vessel should be connected downstream of outlet 18 for receiving the "accept" or that there should be any

means for providing fluid communication between such a vessel and reject nozzle 22.

Regarding claim 13 and the claims depending therefrom, Robinson fails to teach the step of directing separated liquid components and gases into a products vessel and further fails to teach the step of providing fluid communication between such a products vessel and reject nozzle 22.

Specifically with regard to claims 18-19 and 23-24, Robinson expressly teaches a method that is carried out in a device that is open to atmospheric pressure. Col. 3, lines 27-32. As such, Robinson fails to teach a method for separating components of a slurry that includes the step of adjusting pressure, such as adjusting the pressure to that of a slurry being introduced into the hydrocyclone.

Because Robinson fails to teach one or more of the recited elements of each of claims 1 and 13, reconsideration and withdrawal of the rejection of claims 1-8, 10-14, and 16-25 under 35 U.S.C. §102(b) as being anticipated by Robinson is respectfully requested.

Claims 1, 4-8, 11-14, 20-23, and 25-27 are rejected under 35 U.S.C. § 102(b) as being anticipated by Engel et al., U.S. Patent No. 5,900,159 ("Engel").

Engel discloses a method for separating liquid from a slurry. The method is described in two embodiments, each of which uses a hydrocyclone.

In the case of the embodiment that is illustrated in Fig. 1, hydrocyclone 12 is used to degas the slurry before it is pumped through a cross flow filter. Hydrocyclone 12 includes an overflow outlet in communication with line 13 for directing the gas separated from the slurry to a reactor, and an underflow outlet in communication with line 14 for directing a degassed slurry out of the hydrocyclone. Col. 8, lines 22-28. Pump 15 pumps the degassed slurry through cross flow filter 16 where it is separated into a liquid filtrate and a concentrated slurry. The concentrated slurry flowing out of cross flow filter 16 is recycled to the reactor or optionally to pump 15.

In the embodiment illustrated in Fig. 2, hydrocyclone 32 is used to separate a degassed slurry into a first stream having a low concentration of solid particles and a second stream having a high concentration of solid particles.

Hydrocyclone 32 includes an overflow outlet in communication with line 33 for the first stream and an underflow outlet in communication with line 40 for the second stream. The first stream is pumped by pump 34 through a cross flow filter 35 to give a liquid filtrate and a concentrated slurry stream. Liquid filtrate flows out of cross flow filter 35 through line 36 and the concentrated slurry flows out through line 37 to be recycled to the reactor or optionally to pump 31 and/or pump 34.

Regarding claim 1 and the claims depending therefrom, there is no teaching in Engel that the overflow outlet of a hydrocyclone should be connected with a products vessel or that there should be means for providing fluid communication between such a products vessel and the underflow outlet of the hydrocyclone. Regarding claim 13 and the claims depending therefrom, Engel fails to teach the step of directing separated liquid components and gases into a products vessel and further fails to teach the step of providing fluid communication between such a products vessel and an underflow outlet of the hydrocyclone.

Because Engel fails to teach one or more of the recited elements of each of claims 1 and 13, reconsideration and withdrawal of the rejection of claims 1, 4-8, 11-14, 20-23, and 25-27 under 35 U.S.C. §102(b) as being anticipated by Engel is respectfully requested.

#### **Claim Rejections Under 35 U.S.C. § 103(a)**

Claims 9 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stowell or Robinson or Engel et al. in view of Hayatdavoudi. Hayatdavoudi is not relied upon by the Office as teaching any of the elements of claims 1 and 13 that are absent in the teachings of Stowell, Robinson and Engel. As such, these claims are believed to be in condition for allowance by virtue of their dependency from claims 1 and 13, respectively.

Applicants respectfully request reconsideration and withdrawal of their rejection under 35 U.S.C. §103(a).

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All of the stated grounds of objection and rejection are believed to have been properly traversed, accommodated, or rendered moot. Applicants therefore

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respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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